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An Empirical Taxonomy of Crowdfunding Intermediaries

Completed Research Paper

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Abstract

Due to the recent popularity of crowdfunding, a broad magnitude of crowdfunding intermediaries has emerged, while research on crowdfunding intermediaries has been largely neglected. As a consequence, existing classifications of crowdfunding intermediaries are conceptual, lack theoretical grounding, and are not empirically validated. Thus, we develop an empirical taxonomy of crowdfunding intermediaries, which is grounded in the theories of two-sided markets and financial intermediation. Integrating these theories, we develop a crowdfunding intermediation model that we use as foundation for performing cluster analysis with data of 127 intermediaries. We identify three generic archetypes of crowdfunding intermediaries, which differ in their value proposition: Hedonism, Altruism, and For Profit. Our crowdfunding intermediation model and our empirical taxonomy improve our understanding of crowdfunding by showing how crowdfunding intermediaries manage financial intermediation and digitally transform exchange relations between capital-giving and -seeking agents in two-sided online markets. For practice, our research may help characterize the crowdfunding industry.

Keywords: Crowdfunding, empirical taxonomy, two-sided markets, financial intermediation, cluster analyses

Introduction

Recently crowdfunding has emerged as a new way of funding innovative projects, products, or companies. Crowdfunding directly interlinks capital-seeking agents (i.e., initiators of crowdfunding projects such as artists, entrepreneurs, etc.) and a crowd of capital-giving agents (i.e. investors, backers, supporters, or funders). Belleflamme et al. (2013) define crowdfunding as collective financing by an undefined crowd by means of an internet-based open call. This definition follows the thought of crowdsourcing, where a certain task is spread to an undefined crowd by an open call (Estellés-Arolas and González-Ladrón-de-Guevara 2012). Thus, funding activities are no longer restricted to financial institutions such as banks, venture capitalists or business angels but opened up to the public, such that anybody can participate according to their individual financial and mental capabilities. Although the concept of collective financing is not new, e.g., the Statue of Liberty's pedestal had been partly funded by an open call within Joseph Pulitzer's newspaper *The World* (Harris 1985), the internet has boosted the scope and the potentials of the phenomenon (Belleflamme et al. 2013). The underlying mechanisms of the internet economy have shaped crowdfunding to be a novel class of financial intermediaries. Unlike traditional intermediaries, crowdfunding intermediaries characterized by co-creation as capital-giving agents are frequently and systematically involved in the development and commercialization of the funded projects by the capital-seeking agents. This leads to the emergence of a magnitude of small and specialized long tail offers for both markets served by the intermediary, the capital-seeking and -giving agents, and to an increased importance of network effects leading to phenomena such as herding (Burtch 2011) or the wisdom of crowds (Surowiecki 2005).

As a consequence, a broad magnitude of different crowdfunding intermediaries has emerged. Initially, crowdfunding was used to collect donations or funding for small creative projects without monetary rewards, e.g., underground musicians involving their fans in financing their next studio album (fan funding). The application of crowdfunding further expanded to loans between private persons in which capital-giving agents receive interests for borrowing money (peer-to-peer-lending)(Burtch et al. 2013b). Alongside with steadily increasing projects and investments, private-to-business loans and equity-based crowdfunding indicate the next steps(Baeck and Collins 2013). So far, our understanding of these different types of crowdfunding is still very limited. Current crowdfunding research has predominantly focused on investment decisions and motivation of capital-giving agents (Agrawal et al. 2010; Burtch 2011; Burtch et al. 2013a), motivations of capital-seeking agents (Gerber et al. 2012), or the dynamics of successfully funded crowdfunding projects (Mitra and Gilbert 2014; Mollick 2014). By contrast, research on crowdfunding intermediaries has been largely neglected. As a consequence, there are many different conceptualizations hampering our understanding of crowdfunding. For instance, Belleflamme et al. (2013), Ordanini et al. (2011), Bradford (2012), and Hemer (2011) proposed first classifications that differ between 2, 3, 5, or 7 archetypes of crowdfunding intermediaries. In practice, the classification promoted by the consulting agency Massolution (2013) gained widespread attention consisting of the four crowdfunding types crowd-supporting, crowd-donation, crowd-lending and crowd-investing. All these classifications are conceptual in nature, lack theoretical grounding, and are not empirically validated. Lin et al. (2014) were among the firsts to argue that crowdfunding is manifold and addresses diverse interests and therefore, has to be considered differentiated. We will follow this thought. In order to understand the dynamics of crowdfunding, one has to understand how crowdfunding today actually works, and what the constituent parts are, as well as how crowdfunding intermediaries differentiate. Without this knowledge, the dynamics in this context cannot be traced. Information systems are responsible for enabling crowdfunding and an in-deep understanding about this topic helps to develop better solutions for the effective and efficient utilization of this new way of funding. Further, crowdfunding as an umbrella term is much to general in order to serve as precise definition of a research object. In order to examine any field of interest within the topic of crowdfunding, one has to clearly differentiate which type of crowdfunding is actually being studied, since the characteristics between these different crowdfunding types do differ substantially, as shown in this study.

Thus, in this paper we address the question: Which theoretically grounded and empirically validated archetypes of crowdfunding intermediaries do exist? We answer this by developing an empirical taxonomy of crowdfunding intermediaries embedded in the theory of two-sided markets (Rochet and Tirole 2003; Rysman 2009; Weyl 2009) and financial intermediation (Allen and Santomero 1998; Diamond 1984; Diamond and Rajan 1999; Leland and Pyle 1977). Taxonomies reflect empirical tools for

building complex filing systems describing a phenomenon in its defining traits (Rich 1992). As a first step of taxonomy development, we develop and describe a crowdfunding intermediation model, consisting of distinctive characteristics. Second, we use this framework to collect data on 127 crowdfunding intermediaries, with which we perform a cluster-analysis in order to identify the three distinct archetypes Hedonism, Altruism and For Profit, which are representing the value propositions of the crowdfunding intermediaries. Thus, it is the purpose of our taxonomy to characterize the generic exchange relationships and their influences of the crowdfunding intermediation model.

This study provides two important contributions. First, the theory integration may help develop a better understanding of how the internet affects financial intermediation. By that, theory of two-sided markets provides explanation for the participating stakeholders – capital-seeking, capital- giving agents and the crowdfunding intermediary – while financial intermediation theory provides a functional description of crowdfunding functionalities. Second, we provide a systematic and comprehensive taxonomy of crowdfunding intermediaries. Our taxonomy extends existing classifications of crowdfunding intermediaries as it is theoretically grounded, empirically verified, and provides a more fine-grained perspective on the phenomenon. Our results allow for much deeper insights into the phenomenon of crowdfunding. This will help to systematize and synthesize research on crowdfunding.

The paper proceeds as follows. In section 2, we develop a crowdfunding intermediation model illustrating how crowdfunding intermediaries bridge capital-seeking and -giving agents, which serves as foundation for our empirical taxonomy. In section 3, we propose our methodological approach. Section 4 illustrates our results which are then discussed in section 5.

Conceptual and Theoretical Background

Crowdfunding

At first, crowdfunding research has focused on investment decisions of capital-giving agents. Agrawal et al. (2010) show that investment decisions are geographically biased. Burtch (2011) and Burtch et al. (2013b) analyze the prevalence of herding and free riding behavior of capital-giving agents. Lin et al. (2014) investigated archetypes of capital-giving agents. Ahlers et al. (2012) investigate signaling in equity crowdfunding, whereas Lin et al. (2013) and Zvilichovsky et al. (2013) study the influence of social networks on investment decision and overall funding success of projects. Similarly, Mollick (2014) and Mitra (2014) study success factors of crowdfunding projects. Authors also addressed capital-seeking agents. Gerber et al. (2012) studied capital-seeking agents' motives, while Belleflamme et al. (2013) focus on selection decisions for crowdfunding intermediaries. Similarly, Ordanini et al. (2011) examine different types of capital-giving agents, whereas Hui et al. (2013) investigated these agents' tasks in crowdfunding. Similarly, Schwienbacher and Larralde (2012) examine conditions for effective use of crowdfunding for startups. Further, Burtch et al. (2013c) evaluate the use of information hiding mechanisms by capital-seeking agents.

By contrast, research on crowdfunding intermediaries has been very limited. Most notably, Wieck et al. (2013) investigate how information systems for crowdfunding startups can be developed, piloted, and evaluated. Besides, some authors systematized crowdfunding intermediaries based on the returns capital-giving agents receive for their investment. Belleflamme et al. (2013) identify the two poles pre-ordering (i.e. The capital-giving agents purchase a subscription right for the future product. Pre-order prices are usually lower than later selling prices.) and profit-sharing. Bradford (2012) differentiates crowdfunding intermediaries from a legal perspective by what capital-giving agents get in return for their investment. He differentiates between the five types of donation, rewards, pre-ordering, lending, and equity (i.e. profit sharing). Building on this classification, the consulting agency Massolution (2013) differentiates between crowd supporting (subsuming Bradford's (2012) rewards and pre-ordering), crowd lending, crowd investing and crowd donating. Hemer (2011) distinguishes the seven types of donation, sponsoring, pre-ordering, membership fees, crediting, lending, and profit-sharing. However, these classification are of conceptual nature and neither theoretically grounded nor empirically validated. Further, they neglect the role of crowdfunding as financial intermediation and two-sided market, which are the pivotal ideas underlying the concept.

Theory of Two-sided Markets

A multi-sided market is mainly characterized by multiple sets of agents, who are interacting through an intermediary and these groups of agents affect each other through network externalities (Rysman 2009). In crowdfunding two groups of agents are interacting on the crowdfunding intermediary's platform - capital-seeking and capital-giving agents. Therefore, crowdfunding can be seen as two-sided market. The intermediary acts as electronic matching market, enabling the agents to efficiently exchange information about prices and offerings in order to overcome information asymmetries and to minimize transaction costs (Bakos 1991; Bakos 1998; Mahadevan 2000; Malone et al. 1987). The matching platform's attractiveness for one group of agents increases if more agents of the other group sign up, which is referred to as network effect (Caillaud and Jullien 2003; Damiano and Li 2008). To attract both groups of agents, the intermediary chooses strategies and functionalities of pricing and openness (Rysman 2009). The individual pricing mechanism for both groups of agents depends on a joint set of demand elasticities and is regulated by intermediary functionalities (Rochet and Tirole 2003; Rochet and Tirole 2006; Weyl 2009). In crowdfunding these functions represent the intermediary's funding mechanism. Openness refers to the decision of exclusiveness and positioning towards other crowdfunding intermediaries (Rysman 2009), which can be interpreted as the crowdfunding intermediary's specialization. Therefore, theory of multi-sided markets provides a general idea of basic crowdfunding intermediation, by describing the exchange relationship between the participating stakeholders. These are capital-seeking and capital-giving agents, which are mediated by a crowdfunding intermediary by mechanism determining exchange and openness.

Financial Intermediation Theory

Theory of financial intermediation details the exchange relationships and functionalities of crowdfunding intermediation. Financial intermediaries are ubiquitous institutions of economies and pivotal in the saving-investment process, where financial intermediaries lend capital, borrowed from numerous capital-giving agents, to a large number of capital-seeking agents, using debt contracts for both (Gorton and Winton 2003). Financial intermediation theory builds on models of resource allocation between capital-seeking and capital-giving agents by a market-making mechanism (Benston and Smith 1976). Capital-giving agents have different possible returns based on the amount and type of their initial investment. The simplified model of financial intermediation is shown in Figure 1

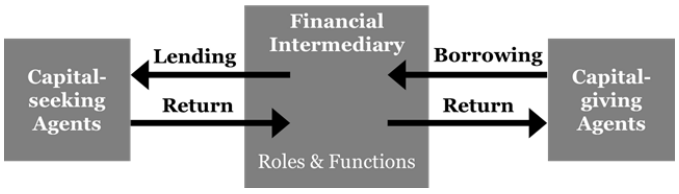

Figure 1: Financial Intermediation (based on Gorton and Winter (2003) as well as Benston and Smith (1976))

Financial intermediaries provide services in imperfect markets, which are characterized by transaction costs (Benston and Smith 1976; Gurley and Shaw 1966) and information asymmetries (Campbell and Kracaw 1980; Fama 1980; Leland and Pyle 1977; Schumpeter 1939). For investigating financial intermediaries, Merton (1989) suggests a functional perspective rather than an institutional perspective. The functions of traditional financial intermediaries can be summarized to lot size, risk, and information transformation (Allen and Santomero 1998; Diamond 1984; Fama 1980; Niehans 1978).

Lot Size Transformation: Financial intermediaries provide payment systems for the exchange of goods as well as mechanisms for pooling funds in order to transfer economic resources through time, geographies, and industries (Merton 1989). Thus, financial intermediaries act as consumption smoothers and liquidity providers (Diamond and Dybvig 1983; Freeman 1996; Gorton and Winton 2003).

Risk Transformation: Financial intermediaries are managing and trading risks and uncertainties (Merton 1989). According to Diamond (1984), financial intermediaries are able to minimize the

significant costs of monitoring due to diversification, and bundling of monitoring activities, as well as avoiding the problem of free riding of capital-giving agents. Thus, financial intermediaries reduce the risk associated with financial transactions (Gorton and Winton 2003).

Information Transformation: Since only capital-seeking agents possess information about the true characteristics of their project, Leland & Pyle (1977) showed that financial intermediaries might efficiently reduce information asymmetries by providing reliable information. Further, Haubrich (1989) addresses the trust and reputation building benefits of an enduring relationship between capital-giving agents and intermediaries. Thus, financial intermediaries are handling information asymmetries and provide price information (Merton 1989) and by that they act as information producers (Gorton and Winton 2003).

Crowdfunding as Digitally Transformed Financial Intermediation

Considering crowdfunding from theory of two-sided markets provides a general understanding of the participating stakeholders and their exchange relationships. In crowdfunding capital-seeking and capital-giving agents are interacting on the crowdfunding intermediary's platform. Internet-based businesses like crowdfunding might lower transaction costs and facilitate matching agents directly, both leading to disintermediation and redundancy of intermediaries (Bakos 1998; Mahadevan 2000). However, the role of intermediation rather faces changed challenges and functions. In contrast to traditional financial intermediaries, crowdfunding intermediaries are not involved in the actual funding process. Crowdfunding intermediaries do not borrow, pool, and lend money on their own account. The intermediary provides certain functionalities and performs as electronic matching market in order to overcome information asymmetries and to minimize transaction costs (Bakos 1991; Bakos 1998; Mahadevan 2000; Malone et al. 1987). As participating agents in crowdfunding are diverse as well as geographically and culturally dispersed, crowdfunding intermediaries are able to exploit and handle the existence of information asymmetries and risks, as they bring price-quality-combinations close to efficient informational combinations (Mahadevan 2000). In order to understand how two-sided markets like crowdfunding reduce information asymmetries and transaction costs they have to perform the three transformation functions, derived from financial intermediation theory (Allen and Santomero 1998; Diamond 1984; Fama 1980; Niehans 1978). To illustrate crowdfunding as digitally transformed financial intermediation in a two-sided market, as well as to identify similarities and dissimilarities, and to derive distinctive features of crowdfunding intermediaries, the roles and functions of financial intermediaries have to be matched with the functions of two-sided markets, like crowdfunding (see Table 1).

Table 1: Functional Perspective of Crowdfunding as Financial Intermediary

Function	Implementation by Financial Intermediaries	Implementation by Intermediaries of Two-sided Markets, e.g. Crowdfunding
Lot size transformation	▪ Payment system for exchange of goods and services (Merton 1989) ▪ Mechanism for pooling funds (Merton 1989) ▪ Transfer economic resources through time, geographies, and industries (Merton 1989) ▪ Smoothing consumption (Diamond and Dybvig 1983; Gorton and Winton 2003) ▪ Providing Liquidity (Diamond and Rajan 1999; Freeman 1996; Gorton and Winton 2003)	▪ Matching capital-giving and -seeking agents enables successful funding (Belleflamme et al. 2013; Mollick 2014; Schwienbacher and Larralde 2012) ▪ Providing mechanisms for payment, exchange of capital, and returns like electronic markets (Bakos 1998) ▪ Bridging capital-giving and capital-seeking agents overcoming time, geographies or industry boundaries (Agrawal et al. 2010; Bakos 1998) ▪ Regulating demand by applying specialized funding mechanisms (e.g., pledge levels) (Mitra and Gilbert 2014)

Risk transformation	▪ Managing uncertainty and risk (Allen and Santomero 1998; Merton 1989) ▪ Delegated monitor (Gorton and Winton 2003)	▪ Assessing credits of the capital-seeking agents ▪ Pre-selecting investment opportunities (projects) ▪ Acting as neutral, trustworthy and objective partner, ensuring integrity (Bakos 1998).
Information transformation	▪ Handling information asymmetries (Fama 1985; James 1987; Kane and Burton 1965; Merton 1989) ▪ Providing price information (Merton 1989) ▪ Producing information (Gorton and Winton 2003; Leland and Pyle 1977) ▪ Commitment mechanism (Gorton and Winton 2003; Haubrich 1989)	▪ Bundling information (Burtch et al. 2013c) ▪ Providing information about investment opportunities (projects) for capital-giving agents (Ahlers et al. 2012; Mitra and Gilbert 2014) ▪ Acting as electronic market place enabling capital-seeking and -giving agents to exchange information about investment opportunities and returns (Bakos 1998; Mahadevan 2000) ▪ Enabling formation of relationships between agents, which is a major source for information and trust (Lin et al. 2013; Zvilichovsky et al. 2013)

Table 1: Functional Perspective of Crowdfunding as Financial Intermediation

Thus, it is shown that crowdfunding is a two-sided market, linking capital-seeking and capital-giving agents via a crowdfunding intermediary. The intermediary applies a certain strategy regarding the funding mechanism and its specialization. Two-sided markets, like crowdfunding are able to reduce transaction costs and information asymmetries by applying similar transformation functions like traditional financial intermediaries. To enable the capital-intermediation process, which can be described as the exchange of funding-capital for a certain return, the crowdfunding intermediary applies a bundle of regulatory funding mechanism, as described in theory of two-sided markets (Rysman 2009). Further, the crowdfunding intermediary chooses a strategy of openness (Rysman 2009). Thus, focuses on a certain project specialization and certain type of capital-giving and -seeking agents. In sum, crowdfunding represents a two-sided market, consisting of capital-seeking and capital-giving agents, who are mediated by a crowdfunding intermediary, which transforms lot sizes, risk, and information, thus, acting as financial intermediaries. In so doing, they reduce transaction costs and information asymmetries using web 2.0 approaches. Thus, by embedding crowdfunding in the theory of two-sided markets and financial intermediation theory, a digitally transformed model of classic financial intermediation can be presented, which is shown in Figure 2. As the single characteristics differ, it seems reasonable to conclude that different types of crowdfunding intermediaries exist, which differ in their basic orientation. These divergent cores of the crowdfunding intermediary refer to their value proposition.

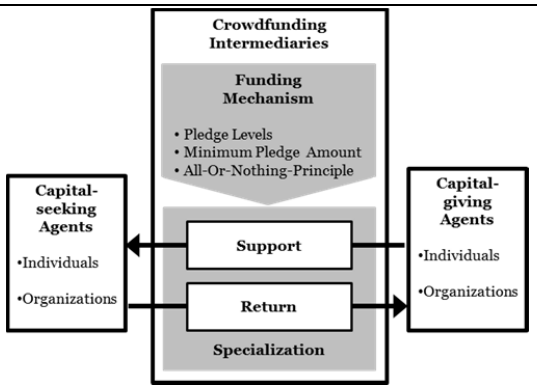

Figure 2: Crowdfunding Intermediation Model

Capital-seeking and -giving Agents: Acting as market makers, crowdfunding intermediaries bridge capital-seeking and -giving agents. Most frequently, capital-giving agents are private person, while capital seeking agents are both private persons (Gerber et al. 2012; Verstein 2011) and organizations, like startups or NGOs (Belleflamme et al. 2013; Bradford 2012; Schwienbacher and Larralde 2012). Besides, the recent adoption of the JOBS-act in the USA indicate, that there are also organizational capital-giving agents (Mollick 2014; Ordanini et al. 2011).

Funding Mechanisms: In order to fulfill the transformation functions, crowdfunding intermediaries provide particular funding mechanisms, like pledge levels, minimum pledge amounts and the all-or-nothing-/keep-it-all-principle (Gerber et al. 2012; Mitra and Gilbert 2014; Mollick 2014; Walsh 2014). Capital-seeking agents define levels of possible pledge amounts. Each pledge level includes a certain return, which increases with higher pledge amounts (e.g., a thank you email for 1 USD, or a poster for 10 USD). A minimum pledge amount defines the lowest possible sum, which can be pledged by the capital-giving agents. Central to crowdfunding is the decision between the all-or-nothing or the keep-it-all principle (Cumming et al. 2014). Applying the all-or-nothing-principle, capital-seeking agents are only granted the collected money if their funding goal has been reached. This is also a type of risk control as it is based on the assumption that capital-seeking agents are only able to accomplish their project and deliver the promised returns in case they have the required resources for doing so. However, there are also some intermediaries that are based on the keep-it-all-principle with which capital-seeking agents receive any collected sum (Gerber et al. 2012).

Return Types: In traditional financial intermediation, capital-giving agents usually receive financial compensation as return for their investment. In the case of crowdfunding, capital-seeking agents also offer investment opportunities, but the particular returns for capital-giving agents may highly vary. According to Bradford (2012), there are five returns with respect to their legal traits: (1) No compensation in case that capital-giving agents support projects for the greater good (donations); (2) Rewards in case capital-giving agents receive a non-monetary return; (3) Pre-ordered product, if the capital-giving agent's support was a prepayment; (4) Interests in case that capital-giving agents participated in a loan; (5) Profit shares, if capital-giving agents receive some form of equity from the project (e.g., a startup).

Specialization: The internet economy is characterized by so called hyperspecialization (Malone et al. 2011). Decreased transaction costs and information asymmetries enable crowdfunding to raise funds for a broad variety of niche projects that would have limited access to more traditional sources of finance. Extending this argument, crowdfunding may create a long tail for the financial service industry in which a magnitude of project with little financial requirements are funded and which cannot be served profitably by traditional financial intermediaries (Anderson 2004). Serving these highly heterogeneous needs, crowdfunding shows a very high degree of specialization in which a magnitude of niche intermediaries has emerged serving a particular segment of the crowdfunding market. The specialization of crowdfunding intermediaries may vary between creative projects and creative products (Agrawal et al. 2010), startups and new businesses (Ahlers et al. 2012; Burtch 2011; Schwienbacher and Larralde 2012) or sustainability and social action (Burtch et al. 2013a; Burtch et al. 2013b).

Methodology

Taxonomy Development

In general, the process of taxonomy development can be divided in the phases of deriving distinctive characteristics for the taxonomy framework as well as clustering homogenous entities (i.e. the objects that shall be classified with the taxonomy; in our case crowdfunding intermediaries) using these characteristics (Fiedler et al. 1996; Larsen 2003; Malhotra et al. 2005; Sabherwal and King 1995). Based on these two steps, Nickerson et al. (2013) propose a more fine-grained approach. They suggest the definition of meta-characteristics in the first instance that represent the most comprehensive traits of the entities and mimic the taxonomy's main purpose. Based on these holistic meta-characteristics, more fine-grained characteristics reflecting distinctive features between entities, enabling comparison and measuring of similarities and differences are then developed (Crowson 1970; McKelvey 1982; Rich 1992). First, we defined the purpose of our taxonomy as distinguishing different archetypes of crowdfunding intermediaries based on their constituent parts. Crowdfunding intermediaries reflect a complex system

consisting of several building blocks which differ substantially in their roles and functions. In order to understand these systems, it is not sufficient to consider the single components separately, but rather to analyze their interaction in the system (Ackoff 1971). According to the purpose of our taxonomy, we followed a deductive approach in order to derive 6 meta-characteristics of the crowdfunding intermediation model by reviewing theory of two-sided markets. By expanding our literature review to financial intermediation theory, we then identified 14 single characteristics and instantiations , which are the logical consequence of the derived meta-characteristics.

Data Collection and Variables

In order to develop our empirical taxonomy, we analyzed a total of 127 crowdfunding intermediaries. Initially, we identified over 500 crowdfunding intermediaries. Crowdfunding intermediaries have been considered for further analysis if they possessed a working, public accessible English or German website, as well as active business operations (i.e. a track record of successfully funded projects) during the time of research (October 2012 to December 2013). These criteria applied to 254 crowdfunding intermediaries such that a random sample of 127 intermediaries was drawn for detailed analysis (50%). We derived 6 meta-characteristics and 14 characteristics by linking crowdfunding to theory of two-sided markets and financial intermediation. Table 2 provides an overview of these characteristics. We developed a coding scheme to content-analyze the websites of each crowdfunding intermediary. Each characteristic of our taxonomy framework was presented by a dichotomous variable indicating whether a certain type of characteristics occurred on a given crowdfunding intermediary or not (e.g., whether or not a crowdfunding intermediary enables capital-seeking agents to offer a certain type of reward such as interests to capital-giving agents). In order to ensure reliability of the content analysis, a subset of 47 randomly picked crowdfunding intermediaries was re-coded by a second researcher. The intercoder reliability was checked using Cohen's Kappa. The value of 0.69 indicates substantial agreement (Landis and Koch 1977). As the recoding took place six month after the initial coding, we ensure a sufficient degree of stability of the characteristics.

Table 2: Overview of Cluster Variables

Meta-Characteristic	Characteristic / Variable	Description	Example
Capital-giving Agents	Individual Capital-giving-Agents	Capital-giving agents, who are private individuals	A private person, who wants to pledge for a caring project
	Organizational Capital-giving Agents	Capital-giving agents, who are organizations or professional investors	A business angel, looking for investment opportunities
Capital-seeking Agents	Individual Capital-seeking Agents	Capital-seeking agents, who are private individuals	A private person, who needs money to buy a new car
	Organizational Capital-seeking Agents	Capital-seeking agents, who are organizations	A company, which needs a loan to expand its business
Return Type	Rewards	Participation on the premise of receiving a non-financial reward	Signed music album of the supported artist
	Interests	Participation on the premise of receiving an interest payment in addition to the amortization of the loan	Interests paid for a P2P-microloan

	Profit Shares	Participation on the premise of receiving a share in the project	An annual profit share of 1% on the pledged equity
	No return	Participation out of idealism with no expectation to receive any form of physical or monetary return	Donation to a NGO
Funding Mechanism	All-or-Nothing-Principle	All-or-Nothing ties the payout of collected funds to a pre-defined minimum level of funding. Keep-it-all disburses all funding regardless of the amount	In an All-or-Nothing setting, projects only receive funds when minimum amount is raised
	Minimum Pledge Amount	Requirement of a certain minimum amount of investment to control the number of investors due to risk-related and administrative reasons	A minimum of 100 EUR has to be pledged
	Pledge Levels	The return of the investment is tied to certain pre-defined levels of capital input	Higher investment means better reward
Specialization	Sustainability & Social Action	Projects which focus on sustainable & caring engagement	Solar-energy projects
	Startups & New Businesses	Projects which aim at the founding of businesses	Young enterprises
	Creative Products & Projects	Projects which support the realization of creative ideas	Artist support

Table 2: Overview of Cluster Variables

We further collected data on the average project volumes and the number of active projects for each intermediary. Following the approach of Malhotra et al. (2005), these two variables were not included in our cluster analysis, but used as external criteria to judge the plausibility of our taxonomy. Data for both variables were collected on a five-point scale where we used five anchors that we derived inductively and deductively following Nickerson et al. (2013).

Cluster Analysis

The taxonomy development process suggested by Nickerson et al. (2013) focuses on the development of mutually exclusive and collectively exhaustive characteristics for developing taxonomies. Thus, we performed cluster analysis to classify crowdfunding intermediaries. A cluster analysis groups entities such that the in-group variation is small in relation to the variation across groups (Aldenderfer and Blashfield 1984; Lorr 1983; Malhotra et al. 2005). By defining distinctive variables, the cluster analysis groups crowdfunding intermediaries according to their reciprocal similarities and differences (Tryon and Bailey 1970). A cluster analysis is a useful method to develop empirical taxonomies describing generic archetypes of a phenomenon (Everitt et al. 2011; Hair et al. 2009). A cluster analysis follows three basic steps. First, proximities or distances between the entities have to be determined. Then, entities are grouped according to these measures using a grouping algorithm. Finally, the optimal number of clusters has to be determined. To avoid idiosyncratic errors peculiar to a specific proximity and distance measure, we tested different proximity (Jaccard, Simple Matching) and distance measures (Euclidean distance) with Ward's algorithm. We report only results using the Euclidian Distance and Ward's grouping algorithm as this combination seems most appropriate for the goals of our research and all combinations produced highly similar results indicating rather robust results. Both, Euclidian Distance and Ward's grouping algorithm are applicable for dichotomous data and have been found to produce reliable results (Van de Vrande et al. 2009). We focused only on hierarchical-agglomerative grouping algorithms as our

aim was to identify clusters and not to validate an already existing number of clusters as in partitioning grouping algorithms. As the focus of the paper is not to over-interpret the membership of single crowdfunding intermediaries to a certain cluster, but rather to develop an empirical taxonomy and the generic characterization of the clusters, we used various methods to validate the number and the robustness of clusters. We used a two-step cluster analysis, a visual inspection of the dendogram and the scree-plot, as well as the Mojena-test for identifying the appropriate number of clusters (Milligan and Cooper 1985; Mojena 1977).

Results

The results of the cluster analysis indicate a robust three cluster solution that can be clearly interpreted. To validate the number of clusters, we first inspected the dendogram as well as the scree-plot which both clearly suggested the existence of three distinct clusters. Second, we performed a Two-Step cluster analysis, using the Schwarz Bayesian criterion, also indicating three clusters. Finally, we applied the Mojena-test, applying a stopping rule of 2.75 (Mojena 1977), also confirming the three cluster solution.

After validating the cluster structure, we conducted further descriptive analysis using cross tabulation and contingency analysis to characterize the clusters and to test whether the identified characteristics contribute to the differentiation of crowdfunding intermediaries. As both the cluster variables and the variable indicating the attribution of crowdfunding intermediaries to the clusters were categorical, we used Pearson's χ^2, Cramer V, and Goodmann & Kruskal's symmetric λ to test whether or not the study variables significantly differ across clusters (Everitt 1977). We analyzed global differences across all three clusters and then applied post-hoc tests, in which we compared single clusters. In order to ensure that the analysis represents a realistic picture of crowdfunding intermediaries, the assignment of intermediaries to clusters was manually verified for plausibility (Malhotra et al. 2005). Table 3 gives an overview of the results of the cluster analysis. These results indicate that our theoretically derived characteristics and cluster variables significantly differ among intermediaries. The only exceptions reflect capital-seeking and -giving agents where we investigated whether the dominant group of agents is individuals or organizations. Our analysis shows that most participating capital-seeking and -giving agents in all clusters are individuals and that variation among clusters is low. By contrast, Cluster 3 shows a significant higher concentration of organizational capital-seeking and -giving agents. We thus followed Nickerson et al. (2013) and did not delete these characteristics from our analysis as we considered the type of participating agents a highly important trait of crowdfunding intermediaries.[1] Our results indicate that all other cluster variables differ significantly across clusters.

Table 3: Results of Crosstab Analysis

Category	Characteristic	Cluster [a]			Significance Tests			Significant Cluster Differences
		1 n=48	2 n=48	3 n=31	χ^2	Cramer V	λ	
Capital-giving Agents	Individual Capital-giving Agents	**100 %**	**100 %**	96.8%	3.02	.154	.012	1-2; 1-3; 2-3
	Organizational Capital-giving Agents	10.4%	33.3%	**58.1%**	20.35***	.400***	.153	1-2**; 1-3***; 2-3*
Capital-seeking Agents	Individual Capital-seeking Agents	64.6%	**75.0 %**	61.3%	1.97	.124	.042	1-2; 1-3; 2-3

[1] We also performed the cluster analysis without considering the type of capital-giving and -seeking agent variables and obtained almost identical results.

	Organizational Capital-seeking Agents	58.3%	54.2%	**83.9%**	7.85*	.249*	.0160	1-2; 1-3*; 2-3**
Return	Reward	**93.8%**	14.6%	6.5%	83.37***	.810***	.602***	1-2***; 1-3***; 2-3
	Interest	2.1%	4.2%	**41.9%**	32.15***	.503***	.126***	1-2; 1-3***; 2-3***
	Profit Share	6.3%	0.0%	**64.5%**	60.18***	.688***	.284*	1-2; 1-3***; 2-3***
	No Return	29.2%	**93.8%**	9.7%	65.21***	.717***	.518***	1-2***; 1-3*; 2-3***
Funding Mechanism	All-Or-Nothing-Funding	**93.8%**	20.8%	54.8%	52.03***	.640***	.470***	1-2***; 1-3***; 2-3**
	Pledge Levels	**91.7%**	12.5%	32.3%	64.05***	.710***	.561***	1-2***; 1-3***; 2-3*
	Minimum Pledge Amount	64.6%	16.7%	**100%**	55.67***	.662***	.404***	1-2***; 1-3***; 2-3***
Special-ization	Sustainability & Social Action	10.4%	**64.6%**	22.6%	33.77***	.516***	.328***	1-2***; 1-3; 2-3***
	Startups & New Businesses	8.3%	0.0%	**74.2%**	69.64***	.741***	.358**	1-2*; 1-3***; 2-3***
	Creative Projects & Products	**41.7%**	4.2%	6.5%	26.17***	.454***	.175*	1-2***; 1-3***; 2-3

* $p \leq 0.05$; ** $p \leq 0.01$; *** $p \leq 0.001$

[a] Percentages of crowdfunding intermediaries in one cluster, which show a given characteristic; bold values indicate the cluster with the highest occurrence of a given characteristic

[b] Significance between Clusters is tested using *Pearson's* χ^2

Table 3: Results of Crosstab Analysis

In order to further characterize the three clusters and substantiate the evaluation of their plausibility, we performed an ANOVA in which average project volumes and active projects per crowdfunding intermediary served as dependent variables. There were significant differences regarding project volumes ($p < 0.01$) and amount of active projects across the three clusters ($p < 0.01$). *Bonferroni* post-hoc comparisons reveal that crowdfunding intermediaries in Cluster 3 have significant higher project volumes and less active projects ($p < 0.01$) than the intermediaries in the other two clusters. There are no differences between intermediaries in Cluster 2 and 3.

Cluster 1 – Hedonism

The cluster Hedonism primarily describes crowdfunding intermediaries, where capital-giving agents pledge for innovative and creative projects and products without receiving financial compensation or other monetary returns. The predominant type of return is reward in form of pre-ordered products, gimmicks, or thank you gifts. Besides, donations by capital-giving agents are quite common. A typical representative intermediary within this cluster is *Kickstarter*[2] on which capital-seeking agents propose innovative products or other creative projects such as the well-known *Pebble*[3] smartwatch or the Oscar-winning movie *Inocente*[4]. These projects have in common that they try to address the capital-giving agents' sense of interest, desire, or joy. Thus, it is the intermediary's value proposition to strive for creating hedonic value that is realized by supporting such projects. On all intermediaries in the Hedonism cluster, capital-giving agents predominantly reflect individuals. Capital-seeking agents reflect both individuals and organizations. Funding mechanisms are designed quite rigid, as the all-or-nothing principle, pledge levels, and minimum pledge amount dominate in exchange of financial support and

[2] https://www.kickstarter.com/

[3] https://www.getpebble.com/

[4] http://www.inocentedoc.com/

rewards. This rigidity is deemed at reducing the risk of underfinancing and motivating capital-giving agents to pledge higher amounts increasing the probability of funding. Hedonism intermediaries are characterized by a large number of small projects. More than 56% of investigated intermediaries entailed 20 or more active projects while 68.8 percent of the projects were seeking for less than EUR 5,000.

Cluster 2 - Altruism

Within the cluster Altruism, capital-giving agents predominantly support crowdfunding projects by donations (93%) such that they neither receive financial nor non-financial compensation for their support. Most projects have a focus on social and ecological projects, or other matters of sustainability. An exemplary intermediary includes *Crowdrise*[5] which comprises of charity projects like donations for victims of environmental disasters. The nature of these projects and the absence of any returns for capital-giving agents suggest that the crowdfunding intermediary primarily emphasizes participation for the greater good and for altruistic reasons. Due to the specialization on sustainability and social action, most intermediaries in this cluster apply quite loose funding mechanisms, which emphasize the contribution to the altruistic nature. Most intermediaries apply a keep-it-all-principle such that capital-seeking agents also receive the pledged money in case the project did not reach the intended amount. Consequently, intermediaries refrain from minimum pledge amounts and pledge levels in order to avoid donation barriers. Individual capital-giving agents are also dominating this cluster. Intermediaries in this cluster primarily consist of a large variety of small-sized projects. More than 60% of investigated intermediaries entailed 50 or more active projects while 75 percent of the projects were seeking for less than EUR 5,000.

Cluster 3 – For Profit

Intermediaries in the third cluster For Profit predominantly offer financial returns for the support of capital-giving agents. These returns may include shared future profits, that may be generated by the crowdfunding project (e.g., capital-giving agents receive some sort of equity capital for a startup), or interest rates for a loan. Therefore, they pursue a value proposition, which is based on the satisfaction of monetary needs. Most intermediaries in this cluster focus on financing startups or similar entrepreneurial ventures. Consequently, capital-seeking agents predominantly consist of organizations (83.9 %) while also individuals are quite common (61.3%). Capital-giving agents consist primarily of individuals but also a significant share of organizational capital-giving agents. Typical intermediaries in this cluster include *FundedByMe*[6], which offers a profit-sharing model, or *Prosper*[7], on which capital-seeking agents may receive loans. Funding mechanisms are reflected by moderate rigidity. The funding mechanisms all-or-nothing and keep-it-all are equally applied. Most intermediaries in this cluster apply minimum pledge amounts. In the case of profit-sharing, this ensures to keep the number of capital-givers, thus co-owners, small. As equity participation is subject to special legal regulation, cost and complexity of handling a broad co-owner structure might be too high and complicates a future sale of the company. Intermediaries are usually characterized by a small number of active projects (e.g., 76.6% of intermediaries have less than 20 projects) but high project volumes. 58.6% of intermediaries handle projects with an average volume of more than EUR 20,000.

Discussion and Conclusion

This study presents crowdfunding as digitally transformed model of financial intermediation, by embedding crowdfunding in the theory of two-sided markets and financial intermediation. This analysis enabled us to derive 14 distinctive, theoretically grounded characteristics for classifying crowdfunding intermediaries. Based on these characteristics, we developed an empirical taxonomy of crowdfunding intermediaries applying cluster analysis. This empirical taxonomy describes three distinct archetypes of crowdfunding intermediaries, which can be prototypically named Hedonism, Altruism, and For Profit. Figure 3 illustrates the three different archetypes of crowdfunding intermediation. Speaking from the perspective of the crowdfunding intermediary, these archetypes are characterized by different value propositions with which crowdfunding intermediaries try to differentiate themselves from other

[5] http://www.crowdrise.com/
[6] https://www.fundedbyme.com/
[7] https://www.prosper.com/

intermediaries. These value propositions represent the generic orientation, which is pursued by the crowdfunding intermediary and define how they organize financial intermediation between capital-seeking and –giving agents. The most distinctive and formative characteristics are reflected by returns and the specializations of crowdfunding intermediaries, which can be interpreted as core of the value proposition. Hedonism intermediaries offer rewards as return and specialize on creative products and projects. Altruism intermediaries enable donations for the greater good addressing sustainable and social projects. For Profit intermediaries grant interests and profit-shares as returns pre-dominantly focusing on startups and new businesses. In a similar vein, the archetypes implement funding mechanism of varying rigidity. Altruism intermediaries show a relaxed level of rigidity in order maximize the fundraising potential of the projects, while the high rigidity level of the Hedonism archetype focuses on the feasibility of the projects in order to reduce risks for capital-giving agents. For Profit intermediaries are characterized by moderate funding mechanisms. On the one hand, minimum pledge amounts ensure a controlled capital structure. On the other hand, both keep-it-all and all-or-nothing principles are used. This indicates that engaging in such projects is riskier, as higher sums have to be pledged and, in the case of the keep-it-all principle, it is lacking the safety net of underfinanced projects. While the For Profit archetype is characterized by large project volumes (> 20,000 EUR) and a lower number of projects (<20), the ratio is turned around for the archetypes Hedonism and Altruism. They show a large number of projects with low project volumes. Individual capital-giving agents are addressed by all archetypes. Organizational capital-giving agents are only relevant for For Profit intermediaries. Additionally, also organizational capital-seekers are mostly found in this cluster. This indicates that this archetype seems to be the most professional one.

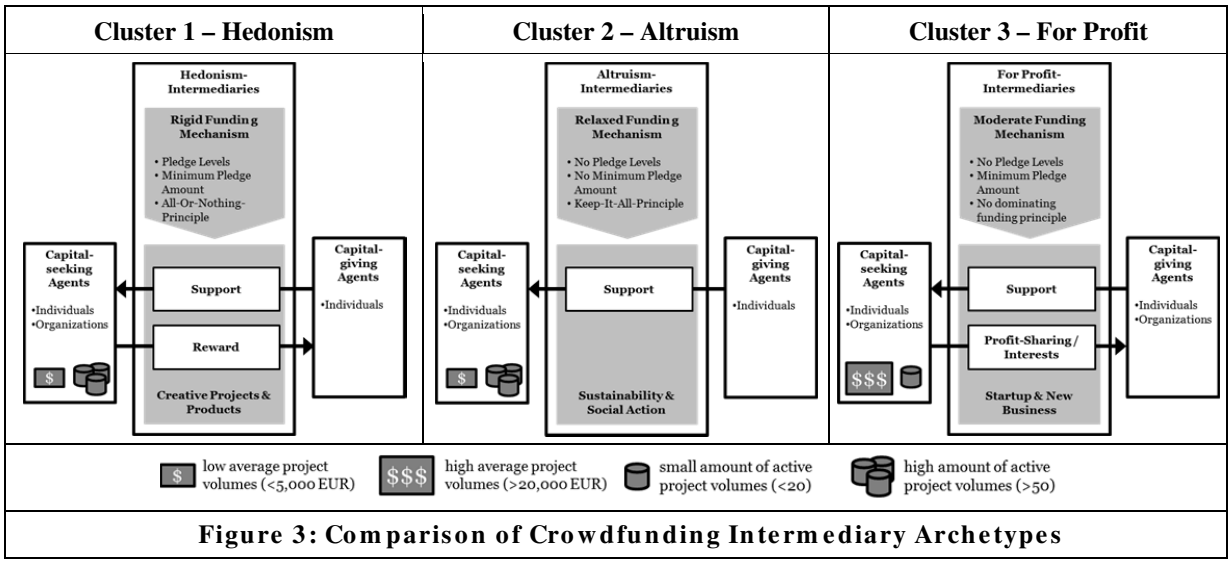

Figure 3: Comparison of Crowdfunding Intermediary Archetypes

The Hedonism cluster is characterized by a value proposition that tries to address enjoyment and arousal to attract potential capital-giving agents with non-monetary rewards like playful, original, and creative products. They enable capital-giving agents to satisfy their curiosity and make them feel like innovators, who are among the first possessing an innovation. By contrast, the value proposition of the cluster Altruism calls on the selflessness of capital-giving agents and promotes a greater good, without providing any kind of return apart from feelings of altruism. These intermediaries thus rather reflect online fundraising campaigns, which enable everybody to call for donations. The For Profit value proposition aims at a monetary orientation such that these intermediaries show in principle high similarity to the traditional financial service industry. Whereas this classification appears to be intuitively meaningful, we follow Rich (1992) for discussing the quality of our empirical taxonomy, who describes seven requirements valid classifications:

1. **Breadth:** In order to ensure sufficient breadth of our approach, we screened more than 500 crowdfunding intermediaries to get a comprehensive market overview.

2. **Meaning:** Our taxonomy is designed upon a broad theoretical foundation, combining the theories of financial intermediation and two-sided markets with crowdfunding. This reveals that crowdfunding intermediaries are too complex to be considered as a homogenous group, which justifies the necessity of a classification system for crowdfunding intermediaries.
3. **Depth:** In order to ensure sufficient depth of our classification, we follow the taxonomy development process suggested by Nickerson et al. (2013) in order to develop collectively exhaustive characteristics for the identification of archetypes. This approach allowed us to account for all important characteristics of crowdfunding intermediaries as proposed by research and practice.
4. **Theory:** Embedding crowdfunding intermediaries in the theories of two-sided markets and financial intermediation provides a theoretically based understanding of the three crowdfunding intermediaries.
5. **Quantitative measurement:** The assignment of crowdfunding intermediaries to specific crowdfunding types is the result of an empirical, multivariate data analysis. Further, we applied various quantitative and post-hoc analyses to show validity of our results.
6. **Completeness and logic:** The characteristics were derived following the taxonomy development method according to Nickerson et al. (2013) and proved to be collectively exhaustive. Therefore, we followed an deductive approach to identify distinctive characteristics. The resulting clusters prove internal consistency and comprehensiveness in their inclusion.
7. **Recognizability:** By deriving the taxonomy characteristics from comprehensive literature review and manually verifying the assignment of platforms to the clusters, we are able to ensure that the results mirror reality and by that describe generic archetypes of crowdfunding intermediaries.

Theoretical and Practical Implications

To our knowledge, this study is the first to investigate crowdfunding from the perspective of the theories of two-sided markets and financial intermediation theory. Our study provides two important contributions. First, crowdfunding is linked to the theory of two-sided markets (Rochet and Tirole 2003; Rysman 2009; Weyl 2009) and financial intermediation (Allen and Santomero 1998; Diamond 1984; Diamond and Rajan 1999; Leland and Pyle 1977). Due to this theory integration, we are able to elaborate on the functions of crowdfunding intermediaries as market makers bridging capital-seeking and capital-giving agents. This presents crowdfunding as digitally transformed model of financial intermediation, which indicates the disruptive potential of crowdfunding in the financial intermediation business. For financial intermediation theory, these results may help develop a better understanding of how the digital transformation affects financial intermediation. The rise of the internet has generally led to an increase in financial intermediation, despite the fact that transaction costs as well as information asymmetries have decreased (Allen and Santomero 1998). Acting as market makers in two-sided markets by transforming lot sizes, risk, and information, crowdfunding intermediaries seem to extend these developments. However, these functions are pre-dominantly performed by a crowd of internet users, while the digitally transformed crowdfunding intermediaries only provide the infrastructure for the exchange between capital-seeking and -giving agents. Compared to traditional financial intermediaries, a substantial part of the tasks associated with financial intermediation is directly performed by the participating agents themselves and not by the intermediary anymore. For instance, traditional financial intermediaries lend and borrow money on their own account, while crowdfunding intermediaries focus on the matchmaking of the agents. This systematic integration of capital-seeking and -giving agents in the value creation associated with financial intermediation may mitigate the paradox stated by Allen and Santomero (1998). This research proposes the integration of the crowd of internet users as an IT-based shift from in-house problem solving towards market-based problem solving (Afuah and Tucci 2012). Further, our theory also contributes to research on two-sided markets (Rochet and Tirole 2003; Rysman 2009; Weyl 2009) by combining the theory's institutional perspective on market agents with the functional perspective of financial intermediation theory using crowdfunding as an example. Thus, our research enables a more indulgent understanding on how intermediaries in two-sided markets manage exchange relationships between multiple classes of agents.

Second, we provide a systematic and comprehensive taxonomy of crowdfunding intermediaries. The purpose of the taxonomy is to characterize the generic exchange relationships and their influences of the crowdfunding intermediation model. Our empirical taxonomy suggests that there are three archetypes of crowdfunding intermediaries with different value propositions: Hedonism, Altruism, and For Profit. Our taxonomy extends existing classifications of crowdfunding intermediaries by various aspects

(Belleflamme et al. 2013; Bradford 2012; Hemer 2011; Massolution 2013). It is theoretically grounded, empirically verified, and provides a more fine-grained perspective on the phenomenon, instead of taking into account the type of return capital-giving agents receive for their investment only. Our results allow much deeper insights into the phenomenon of crowdfunding and will help systematize and synthesize research on crowdfunding. Our taxonomy abstracts from single peculiarities of specific crowdfunding intermediaries and projects and by that enables generalizable propositions. Our empirical taxonomy pinpoints three overarching classes of value propositions providing a better understanding of the phenomenon. Taxonomies, which are based on the value proposition of the intermediaries, have been applied successfully to the field of crowdsourcing as well (Geiger et al. 2011; Kaufmann et al. 2011; Rouse 2010). This supports and justifies our approach. For practice, our empirical taxonomy provides a comprehensive overview on the crowdfunding market and different types of crowdfunding intermediaries. For traditional financial intermediaries this taxonomy helps to characterize potential competitors in a new competitive arena and helps them gain a better understanding of the disruptive potential of crowdfunding. These results will gain in importance, particularly when crowdfunding intermediaries will be established more solidly in the mass market as complement (or substitute) for traditional financial intermediaries. Both, the theory integration of crowdfunding in theory of two-sided markets and financial intermediation, as well as the presented taxonomy can serve as starting point in the digital transformation process of traditional financial intermediaries by providing a better understanding and systemization of the value propositions and differentiating characteristics within their business models.

Limitations and Future Research

While our study is a first approach on developing a theoretically grounded and empirically tested taxonomy of crowdfunding intermediaries, there are some important concerns to our research. First, our sampling procedure was limited to crowdfunding intermediaries with an English or German website. Taking into account intermediaries with websites comprising of other languages might, in principle, produce slightly different clusters. However, the investigated platforms show a broad geographic dispersion, also including a variety of non-English or non-German speaking countries. Further, the USA, UK, and Germany are among the biggest and most mature crowdfunding markets worldwide such that we strongly believe that our results are well generalizable. A second limitation of our study relates to our qualitative data collection effort. While we put high effort in ensuring reliability and validity of our data, using objective platform data might have produced an even more sophisticated assessment of crowdfunding intermediaries. However, many of the characteristics investigated in our study have a dichotomous nature such that it was a deliberate decision to collect all data as dummy variables in order to reduce complexity of the taxonomy development and cluster analysis. Finally, the crowdfunding industry is highly dynamic with most crowdfunding intermediaries being startups. Also, investment sums have highly increasing funding volumes across the world as the crowdfunding industry matures. As a consequence, models of financial intermediation are constantly evolving in the crowdfunding industry leading to the future development of novel types of crowdfunding. However, we strongly believe that our empirical taxonomy describes stable archetypes of crowdfunding intermediaries that withstand even further increasing industry dynamics. The theoretical grounding of our taxonomy in financial intermediation theory and theory of two-sided markets as well as our categorical data collection both abstract from single peculiarities of crowdfunding intermediaries. They emphasize the basic principles of crowdfunding intermediaries and corresponding exchange relationships between involved agents. Both proved to be stable within the timeframe of this research, whereas financing conditions of crowdfunding intermediaries constantly changed. Researching the fast developing crowdfunding industry may improve our understanding of how digitization and the internet affect and reconfigure existing industries such as the financial service industry. In this regard, our taxonomy may serve as a first step of doing so pinpointing to important avenues for future research. Our taxonomy leads to the assumption that in particular e.g. capital-giving and capital-seeking agents may follow different motivations for supporting crowdfunding projects. Success factors or platform design principles might differ as well and should be further examined. Therefore, we need more extensive research on these topics with respect to the specific differences between the identified crowdfunding archetypes. Additionally, examining the question of which same-side and cross-side effects can be observed in crowdfunding intermediation will help develop a deeper understanding of how crowdfunding actually works and what similarities and differences to other forms of crowd-based approaches exist.

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